



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/776,080	02/01/2001	Wei-Lien Hsu	5500-60900	9437

7590 12/23/2004

B. Noel Kivlin  
Conley, Rose & Tayon, P.C.  
P.O. Box 398  
Austin, TX 78767-0398

EXAMINER
----------

DO, CHAT C

ART UNIT	PAPER NUMBER
----------	--------------

2124

DATE MAILED: 12/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/776,080

Applicant(s)

HSU ET AL.

Examiner

Chat C. Do

Art Unit

2124

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3, 6-12 and 14-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 11, 12, 14-19, 21 and 22 is/are rejected.
- 7) ☒ Claim(s) 2, 3 and 6-10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This communication is responsive to Amendment filed 09/07/04.
2. Claims 1-3, 6-12, 14-19, and 21-22 are pending in this application. Claims 1, 11, and 16-19 are independent claims. In Amendment, claims 1, 6, 11, and 16-19 are amended; claims 4-5, 13, and 20 are cancelled; and claims 21-22 are added. This action is made final.

#### ***Claim Objections***

3. Claim 6 is objected to because of the following informalities:

Re claim 6, the applicant is advised to amend claim 6 to depend on the existing claim. For examination purposes, the examiner considers claim 6 is dependent on claim 1.

Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 11, 14-19, and 21-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Horton (U.S. 6,421,696).

Art Unit: 2124

The applied reference has a common assignee, Advanced Micro Devices, Inc., with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Re claim 1, Horton discloses in Figures 3 and 8 a method of performing a two-dimensional discrete cosine transform (DCT) using a microprocessor having an instruction set that includes single-instruction multiple-data SIMD floating point instructions (abstract and col. 3 lines 24-30), wherein the method comprises: receiving a two-dimensional block of integer data having C columns and R rows (col. 1 lines 57-58 and col. 1 lines 36-42 wherein the frame of a video or image is a two dimensional data with rows and columns), wherein each of the R rows contains a set of C row data values, wherein the block of integer data is indicative of a portion of an image (col. 1 lines 36-42), wherein each of C and R is an even integer; and for each row, loading the entire set of C row data values of the row into a set of C/2 registers of the microprocessor (Figure 6 and col. 2 lines 44-50); converting the C row data values into floating point form (col. 4 lines 60-65), wherein each of the registers holds two of the floating point row data values (Figure 6); and performing a plurality of weighted-rotation operations on the values in the registers (Figure 10), wherein the weighted-rotation operations are performed using SIMD floating point instructions (col. 5 lines 1-6 and lines 28-34); altering the arrangement of values in the registers (e.g. arrangement needs to be made to reduce

complexity and avoid bottle neck and col. 2 lines 35-50); performing a second plurality of weighted-rotation operations on the values in the registers; again altering the arrangement of the values in the registers; performing a third plurality of weighted-rotation operations on the values in the registers; yet again altering the arrangement of the values in the registers (col. 5 lines 20-25); performing a fourth plurality of weighted-rotation operations on the values in the registers to obtain  $\phi$  intermediate floating point values: and storing the C intermediate floating point values into a next available row of an intermediate buffer (depending on the number of input data, more stages are repeated as seen in Figure 10 and Figure 1).

Re claim 11, it has the same limitations cited in claim 1 wherein the input data is the column instead of the row (e.g. since the reference does not define the input data is row or column, therefore, the row or column can be interchanged). Thus, claim 11 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claims 14-15, they have same limitation cited in claim 1. Thus, claims 14-15 are also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 16, it is a computer system claim of claim 1. Thus, claim 16 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 17, it is a carrier medium comprising software instruction claim of claim 1. Thus, claim 17 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 18, it is a computer system claim of claim 11. Thus, claim 18 is also rejected under the same rationale as cited in the rejection of rejected claim 11.

Art Unit: 2124

Re claim 19, it is a carrier medium comprising software instruction claim of claim 11. Thus, claim 19 is also rejected under the same rationale as cited in the rejection of rejected claim 11.

Re claim 21, Horton further discloses in Figures 3 and 8  $C=8$  and  $R=8$  (e.g. col. 1 lines 35-40 with video/image size and its 1-D is 8 as seen in Figure 8).

Re claim 22, Horton further discloses in Figures 3 and 8 each of the weighted rotations of plurality, second plurality, third plurality and fourth plurality have a computational form given by the expressions:  $Y0 = A*X0 + B*X1$ ,  $Y1 = -B*X0 + A*X1$ , wherein A and B are coefficients,  $X0$  and  $X1$  are inputs to the weighted rotation,  $Y0$  and  $Y1$  are results of the weighted rotation (col. 4 lines 25-26).

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being obvious over Horton (U.S. 6,421,696).

Re claim 12, Horton does not discloses in Figures 3 and 8 the operation is done using a pfmul, a pfsub, and a pfadd instruction. However, the examiner takes an official notice that these instructions pfmul, pfsub, pfadd are known in the prior art. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the

Art Unit: 2124

invention is made to add the pfmul, pfsub, and pfadd instructions into Horton's invention for performing the DCT operations because it would enable to simplify the system software and increase the performance.

***Allowable Subject Matter***

8. Claims 2-3 and 6-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

9. Applicant's arguments with respect to claims 1, 11-12, 14-19, and 21-22 have been considered but are moot in view of the new ground(s) of rejection.

Conventionally, the 2-D DCT can be performed by using 1-D DCT engine, transposed, and another same 1-D DCT engine wherein when transposed the results of 1-D DCT, the row data would be the column data and vice versa.

***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. U.S. Patent No. 4,821,224 to Liu et al. disclose a method and apparatus for processing multi-dimensional data to obtain a Fourier transform.

Art Unit: 2124

- b. U.S. Patent No. 4,601,006 to Liu discloses an architecture for two dimensional fast Fourier transform.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (571) 272-3721. The examiner can normally be reached on M => F from 7:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chaki Kakali can be reached on (571) 272-3719. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

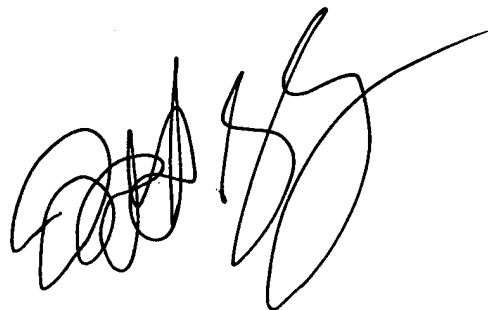


Art Unit: 2124

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do  
Examiner  
Art Unit 2124

December 7, 2004

A handwritten signature in black ink, appearing to read 'TODD INGERBERG', with a long horizontal flourish extending to the right.

**TODD INGERBERG  
PRIMARY EXAMINER**